



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/549,991

09/19/2005

M Selim Unlu

BU-116XX

1023

207 7590 04/14/2009
WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP
TEN POST OFFICE SQUARE
BOSTON, MA 02109

EXAMINER

TURK, NEIL N

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

04/14/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/549,991	Applicant(s) UNLU ET AL.	
	Examiner NEIL TURK	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-25 and 27-45 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-25 and 27-45 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/19/05 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remarks

This Office Action fully acknowledges Applicant's remarks filed on January 29th, 2009. Claims 1-3, 5-25, and 27-45 are pending. Claims 4 and 26 have been cancelled. Any objection/rejection not repeated herein has been withdrawn by The Office.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "the at least one of the first and second reflective surfaces having capturing material disposed in a pattern of an array to generate a plurality of resonant cavity regions" as in claim 1, or the plurality of regions in a pattern of an array between the first and second reflective surfaces, each defining a resonant cavity (as in claims 23, and 44) (or cavity, i.e. as recited in claims 2, 24, and 45) must be shown or the feature(s) canceled from the claim(s). Further, the beam expander (claim 10) and beam condenser (claim 11) must be shown. Additionally, the photodetector array integral with a support for one of said reflective surfaces which is not supporting a capturing material, as defined in claim 20, must be shown. Further, with respect to claim 44 the "zone" defined between the first and second reflective surfaces must be shown. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

Art Unit: 1797

prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The specification lacks antecedent basis for the amended recitation of claim 1 to “...to generate a plurality of resonant cavity regions”.

Claim Objections

Claim 22 is objected to under 37 CFR 1.75 as being a substantial duplicate of **claim 19**. When two claims in an application are duplicates or else are so close in

Art Unit: 1797

content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). As both the “means for dynamically varying spacing of the first and second surfaces” and “means for varying the spacing of said reflective surfaces” are both drawn to the same structural elements of the micrometers coupled to the piezo-control elements, claim 22 is seen to be a duplicate of claim 19. Further there is no additional structure provided for the function in claim 22 of varying the cavity resonance, and as such, this is seen as an inherent function in the varying of the spacing.

Claim 27 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 27 does not further limit the subject matter of their respective, previous claim(s) as claim 27 is drawn to further limitations of the capture material. Independent claim 23 does not establish the capturing material as a positively claimed element of the device, nor do they establish the application of such a capturing material as a step in the process. Independent claim 23 merely establishes that either one of the first and second reflective surfaces have a capability of receiving a capturing material. As independent claim 23 does not establish the capturing material as a positive element of the method, the dependent limitations

Art Unit: 1797

which point to the positive establishment of a capturing material in claim 27, does not further limit the subject matter of the respective previous claim(s).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3, and 5-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by the amended recitation, "...having capturing material disposed in a pattern of an array to *generate* a plurality of resonant cavity regions". The term "generate" implies an active process involved and as the limitation is drawn to a structural element, it is unclear how such a term is being applied. Does Applicant intend to recite the phrase "to form"?

Clarification is required.

Claims 9, 17-19, and 22 recite "means for sweeping the wavelength", "means for causing said radiation to emit at discrete different wavelengths", , "means for dynamically varying spacing", "means for varying the spacing", respectively. The Examiner has interpreted this limitation as a means-plus-function limitation covered by 35 USC 112, sixth paragraph. This interpretation is proper since the claim limitation

Art Unit: 1797

recites “means for” language, and the “means for” is not modified by sufficient structure for achieving the specified function. A means-plus-function limitation recites a function to be performed rather than definite structure or materials for performing that function. For claims falling under 35 USC 112, sixth paragraph, Examiners are required to construe claims as covering the corresponding structure, material, or acts described in the specification and equivalents thereof, see *In re Donaldson Co.*, 29 USPQ2d 1845 (Fed. Cir. 1994). However, the specification does not set forth the corresponding structure. Thus, it is unclear and indefinite what structure Applicant is intending to encompass with the “means for sweeping the wavelength”, “means for causing said radiation to emit at discrete different wavelengths”, “means for dynamically varying spacing”, and “means for varying the spacing” limitations.

Claims 9 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by the recitation, “...sweeping the wavelength of said tunable laser (radiation; cl. 31) over a range...”. As the recitation of “the wavelength” points to a single wavelength, it is unclear how a single wavelength may allow for sweeping over a range. As such, a tunable laser or tuning radiation will be taken to read on such sweeping as recited in the claims.

Claims 23-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

Art Unit: 1797

applicant regards as the invention. With regards to independent claims 23 and 24, the detecting step is unclearly recited in the claims. **Claim 23** recites, in relevant part, "...detecting the radiation in each said cavity and operative to indicate a change in the standing wave pattern reflective of binding of capturing material with material in a fluid within each said cavity". First, the recitation is not clearly understood as the recitation does not read properly, and appears to be missing a few articles of speech. Further, what is meant by "...and operative to indicate a change"? Does Applicant intend to recite that the detected radiation is operative to indicate a change...? Further, the detecting step is unclear in how it is operative to indicate a change in the standing wave pattern reflective of binding of the capturing material with material in a fluid within each cavity, as neither the capturing material nor the material in a fluid have been positively recited as steps in the method. Applicant does not recite steps, such as providing a fluid with material and a capturing material to the resonant cavities. As such, it is unclear how any such detection or indication can be made if the capturing material and material are not positively provided as part of the method.

Likewise, **claim 24** contains the same issues that pertain to claim 23. Herein however, the detected radiation is operative to indicate the level of binding by the capturing material of material in said fluid within each cavity. As discussed above, this detection is unclear as the capturing material and material have not been positively established in the method. Further, it is unclear what is meant by, "...detecting the radiation of binding by said capturing material of material in said fluid within each said cavity". What level of binding is being detected? Does Applicant intend to detect the

Art Unit: 1797

level of binding of the capturing material to the material? Is the binding between the capturing material and something else? Clarification is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

Art Unit: 1797

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5-7, 10-16, 21, 23-25, 27-29, 32-37, 42, 44, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinkel et al. (5,982,534) in view of Pepper et al. (2002/0068018), hereafter Pepper.

Pinkel discloses a specimen illumination apparatus (abstract; lines 28-37, col. 4; col. 7&8, fig. 1). Pinkel discloses with a first reflective surface slide 303 and a second reflective coverslip 305 formed on top, thereby forming a channel to accommodate specimen 317 therebetween. Examiner asserts there exists a plurality of regions in a pattern of an array between the reflective surfaces 303 and 305, as such claimed regions are not bound/defined by any specific structural elements/limitations and thereby such regions can be said to exist in the space between the first and second surfaces 303, 305. Pinkel further discloses an excitation source 311 (such as any known excitation source, e.g. a laser; lines 54-65, col. 7) to provide excitation light through optical cavity 301, and it thereby enters slide 303 by prism 313 (beam expander) where it is reflected by total internal reflection from the lower surface of slide 303. The light can then undergo total internal reflection from the coverslip 305, and after multiple reflections between slide 303 and coverslip 305, light may then make multiple passes back and forth between the two prisms 313 and 315. Pinkel further discloses that lens 319 detect light emitted or scattered by the specimen, and lens 319 (beam condenser) collects scattered and/or fluorescent light, and the lens can be a

Art Unit: 1797

component of any known device for detecting an optical signal, such as photodiodes, CCD cameras, etc. (lines 1-34, col. 5; lines 35-50,col. 8; column 11, figs. 1-3).

Pinkel does not specifically disclose the use of an IR radiation source, or applying IR radiation.

With regard to claim 1, Pinkel does not disclose at least one of the first and second reflective surfaces having capturing material disposed in a pattern of an array to generate a plurality of resonant cavity regions. Further, as in claim 5, Pinkel does not disclose a capturing material that is DNA or protein selective. Pinkel does not disclose an array of regions, in which each region defines a resonant cavity or cavity as defined in independent claims 2, 23, 24, 44, and 45.

Pepper discloses a compact sensor for biological or chemical species using microcavity structures (abstract). Pepper discloses a metal or dielectric surface 1 textured with a lattice to form microcavities 2 in an array pattern, into which particles of material to be detected can fall. Pepper discloses that due to the field enhancement inside the cavities 2, the adsorption of the probe beam 4 (such as an infra-red probe beam) is much greater than it would be if the particle were simple in a free space or on a smooth surface (paragraphs [0004, 0033, 0037, 0044, 0051, 0052, 0056, 0076, 0084]+, fig. 1+). Pepper discloses a metal or dielectric surface with a lattice to form microcavities in an array pattern (such as micro-resonantors, [0056]), and such an array pattern is coated with attracting material 5 (capturing material as recited) thereby maintaining to provide a plurality of resonant cavity regions that attracts the agent to be detected ([0053,0088,0091-0093], for example). Pepper further discloses that

Art Unit: 1797

antibodies are preferable attracting agents ([0146])(as in cl. 5). Pepper further discloses a scanning detector 11 so as to detect the signal from each section of the surface 1 (paragraph 0127).

It would have been obvious to modify Pinkel to include the use of an IR radiation source and applying IR radiation such as taught by Pepper in order to provide a known alternative source of radiation for use in an optical interrogation sensing system.

It would have been obvious to modify Pinkel to include one of the layers with a textured latticed defining an array of resonant cavities such as taught by Pepper in order to provide field enhancement of the species being analyzed so as to allow for greater sensitivity in detection, and further to include a capturing material for such an array, such as in the form of antibodies, so as to allow for selective detection of a particular agent or antigen (in the case of antibodies being used).

Claims 8, 9, 17, 30, 31, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinkel in view of Pepper as applied to claims 1-3, 5-7, 10-16, 21, 23-25, 27-29, 32-37, 42, 44, and 45 above and in view of Lewis et al. (4,917,462), hereafter Lewis.

Pinkel/Pepper has been discussed above.

Pinkel/Pepper does not specifically disclose a tunable laser, means for causing the radiation source to emit at discrete wavelength, tuning the applied radiation, or sweeping the wavelength over a range.

Lewis discloses an optical microscopy device and technique for use in the microanalysis of materials (abstract). Lewis discloses that light, from an intense, tunable light source 60, such as a laser, is directed in a transmission mode of operation through the transparent stage 58 and into the sample 56 to be imaged. Lewis discloses that the light excites spectral phenomena in the sample, such as through fluorescence (lines 15-35, col. 10).

It would have been obvious to modify Pinkel/Pepper to include tuning of the applied radiation and sweeping over a wavelength range by way of a tunable laser source that may emit at discrete different wavelengths such as taught by Lewis in order to provide a known alternative light source for optical scanning to produce fluorescence emissions of target samples, and further to have a tunable source so as to provide the specified wavelength(s) of excitation light depending on the target sample at-hand.

Claims 18 and 39 rejected under 35 U.S.C. 103(a) as being unpatentable over Pinkel in view of Pepper as applied to claims 1-3, 5-7, 10-16, 21, 23-25, 27-29, 32-37, 42, 44, and 45 above and in further Saul et al. (5,851,488), hereafter Saul.

Pinkel/Pepper has been discussed above.

Pinkel/Pepper does not disclose means for controlling a temperature of fluid in the channel, or controlling a temperature of fluid within the channel.

Saul discloses an electro-optical instrument for measuring a quantitative parameter of a sample by measuring fluorescence emitted. Saul discloses heating the

sample to a proper temperature for the particular assay by way of a heater plate 54 about the cartridge 24 where sample is held (lines 30-41, col. 9, fig. 4A).

It would have been obvious to modify Pinkel/Pepper to include a heater plate for controlling a temperature of the fluid within the channel and to control the temperature of the fluid within the channel such as taught by Saul in order to provide for maintaining the sample at the proper temperature necessary for the most accurate assay.

Response to Arguments

Applicant's arguments filed January 29th, 2009 have been fully considered but they are not persuasive.

With regards to claims 9, 17-19, and 22 rejected under 35 USC 112, 2nd paragraph, Applicant traverses the rejection. Applicant provides examples of what each “means for” recitation may be structured as. In response, Examiner argues that Applicant’s showings for each of the “means for” recitations further indicates the lack of clarity in the claims. First, with respect to the “means for sweeping the wavelength” Applicant points to page 8, lines 1-3 of WO 2004/083820. Such a disclosure is not persuasive to provide definite basis for “means for sweeping” as the disclosure relates to a process of developing an intensity wavelength response, in which a computer causes a tunable laser to scan through a set of wavelengths. The duty to link or associate structure or function is the quid pro quo for the convenience of using 35 USC 112, 6th. Does Applicant intend to claim a controller applied to the tunable laser, such that the tunable laser source is already recited in the claim? Second, with respect to the

Art Unit: 1797

“means for causing said radiation to emit at discrete different wavelengths”, Applicant argues that such “means for” language is disclosed, for example as a controller card (36) and/or a tunable laser (1). This argument is not persuasive to providing a clear link to the “means for causing said radiation to emit at discrete different wavelengths” as first, the disclosure does not mention causing radiation to emit at discrete wavelengths. Further, Applicant asserts that such a “means for” recitation is drawn to a controller card and/or a tunable laser. This is further unclear as how does a controller card 36 equate to a tunable laser 1 (in the “or” case) for providing such a function? Further, the fact that Applicant has provided the option of “and/or” further shows that one of ordinary skill in the art would not understand what structural element(s) make up the “means for causing radiation to emit...” Third, with respect to the “means for controlling a temperature”, Applicant points to heating element 42 and heat control unit 43 for such a recitation. Such an exemplary showing will remove the lack of clarity with respect to the “means for controlling a temperature”, however such an exemplary showing does not limit the “means for controlling a temperature” to only a heating element and a heat control unit. Fourth, with respect to the means or step for “dynamically varying spacing” and the means “for varying spacing of said reflective surfaces”, Applicant argues that such limitations can refer, for example, to a computer 34, a control card 36, adjusters 23 and 24, and a piezoelectric controller 37. Such a showing is not persuasive to provide clear basis for the means or step for “dynamically varying spacing” and the means “for varying spacing of said reflective surfaces”. Whereas the disclosure mentions these elements, the disclosure is not clear in linking such elements for the recited means/step

Art Unit: 1797

for limitations. Further, the disclosure recites a camera 32 for indicating out-of-parallel conditions between the stages, and it is unclear if this element is part of the means/step for limitations. Additionally, Applicant has provided a list of dissimilarly functioning elements which supposedly provide for the means/step for limitations. For example, how does a control card 36 provide such a function, and how does one equate a control card to "adjustors"? Is it the combination of the computer 34, control card 36, adjustors 23 and 24, and piezoelectric controller 37 that give the means/step for limitations? If so, how are these elements linked so as to provide such function? Examiner further notes that Applicant's response shows that the means/step for "dynamically varying spacing" is the same as the means for "varying spacing".

With regards to claims 9 and 31 rejected under 35 USC 112, 2nd paragraph and claims 23-43 rejected under 35 USC 112, 2nd paragraph, Examiner notes that no arguments have been applied against such rejections, and the claims are maintained rejected under 35 USC 112, 2nd paragraph for the reasons discussed above.

With regard to the objection of claim 27 as failing to further limit the parent claim, Applicant traverses the rejection. Examiner does not note any specific arguments with respect to claim 27. Further, Examiner maintains the claim 27 does not further limit claim 25 or 23 as the capturing material has not been positively applied as an active step in the method.

With regard to claim 22 objected to under 37 CFR 1.75(c) as being a substantial duplicate of claim 19, Applicant traverses the rejection. Applicant argues

Art Unit: 1797

that claim 19 relates to dynamically varying the spacing, and claim 22 relates to just *varying* the spacing. Applicant further argues that the different surfaces recited in claims 19 and 22 could be different surfaces whose spacing is varied. Examiner argues that the only usage of the term surfaces in claim 1, to which both claim 19 and 22 depend from, is two the reflective surfaces 14, 15 and the capturing material is applied to one of these surfaces. Further, the mirror 14 is referring to the same element of reflective surface 14. Additionally, Applicant's arguments on page 31 of this response with respect to the means/step for recitations of "dynamically varying spacing" and "varying spacing" have shown that the two recitations are the same as both relate to the same list of elements.

With regard to the objection to the drawings, Applicant traverses the rejection. Applicant responds that the "plurality of regions in a pattern of an array...each defining a resonant cavity" are shown in figure 2, 10A, and 4. Applicant asserts that figure 4 shows a capturing material 90 at a single cell of the resonant cavity 16. This showing points to a single resonant cavity 16 and not a plurality of resonant cavities in an array. Further, none of the mentioned figures correspond to such a limitation as figure 2 shows an array of cells 80 and figure 10A relates to a model of an SiO₂ pattern. Further, as amended the claim recites, "...at least one of the first and second reflective surfaces having capturing material disposed in a pattern of an array to generate a plurality of resonant cavity regions. Examiner asserts that the objection to the drawings

has been adjusted so as to reflect such an amendment, and Examiner asserts that such an amended recitation is also not shown in the drawings.

With regards to the "beam expander" and "beam condenser" of claims 10 and 11, Applicant argues that lens 7 and 10 operate to condense the beam to a focal point (9) and to expand the beam from the focal point. Applicant also argues that focusing lens (31) also is shown to condense and to expand a beam (30). Examiner argues that Applicant's arguments are drawn to process limitations of the optics and does not address which optical element is the "beam expander" and which is the "beam condenser". Is the lens 7 the beam condenser? Lens 10? Is lens 7 the beam expander? Lens 10? Is focusing lens 31 the beam condenser? Is focusing lens 31 the beam expander?

With respect to claim 20, Applicant argues that the "photodetector array integral with a support for one of said reflective surfaces which is not supporting a capturing material" is shown in figure 1 by upper (22) and lower supports (17) having dedicated adjustors (23 and 14, and 25, respectively). [As an aside, the adjustors have been referred to as elements 23 and 24 previously and it is unclear how elements 14 and 25 relate.] Applicant asserts that capturing material is only required on one of the reflective surfaces. Applicant thereby argues that whichever reflective surface does not include capturing material reads on the claim. Examiner argues that such arguments do not show which element refers to such a described photodetector array as recited in claim 20. Additionally, Applicant is bringing in conditional claim limitations to support a showing in the drawings, which is not persuasive. With respect to the drawings, where

Art Unit: 1797

is (by designation of a reference numeral) the "photodetector array integral with a support for one of said reflective surfaces which is not supporting a capturing material"?

Examiner further notes that in figure 12, the detection system 168 (in which claim 20 recites that such a photodetector array is included) is set away and is not integral with any support as claimed.

Further, the "zone" of amended claim 44 must be shown in the drawings.

Applicant's arguments with respect to claims 1-7, 10-16, 21, 23-29, 32-37, 42, 44, and 45 rejected under 35 USC 103(a) over Pinkel in view of Pepper have been considered but are moot in view of the new ground(s) of rejection, as discussed above. Applicant argues that each of independent claims 1, 2, 23, 24, 44, and 45 recites a plurality of regions in a pattern of an array made from a capturing material, each of which defines a cavity or a resonant cavity. Examiner argues that Applicant's argument is not commensurate in scope with the claims. Independent claims 2, 23, 24, 44, and 45 do not recite a plurality of regions in a pattern of an array made from a capturing material, which defines a cavity or resonant cavity. Claims 2 and 23 merely recite a capability for a capturing material to be received and the array is not made from the capturing material. Claims 44 and 45 do not mention a capturing material that forms such an array.

Examiner asserts such an argument only applies to claim 1. Claim 1 has been amended to recite that at least one of the first and second surfaces having capturing

Art Unit: 1797

material disposed in a pattern of an array to generate a plurality of resonant cavity regions.

Applicant argues that Pinkel and Pepper both do not teach, mention, or suggest having or applying a capturing material in a pattern of an array on one of the reflective surfaces forming the channel. Examiner argues that, as discussed above, Pepper discloses a metal or dielectric surface with a lattice to form microcavities in an array pattern (such as micro-resonantors, [0056]), and such an array pattern is coated with attracting material 5 (capturing material as recited) thereby maintaining to provide a plurality of resonant cavity regions that attracts the agent to be detected ([0053,0088,0091-0093], for example). Pepper further discloses that antibodies are preferable attracting agents ([0146])(as in cl. 5).

Examiner thereby asserts that the combination of Pinkel in view of Pepper, as discussed above, meets the limitations of claim 1 and such a combination provides the an obvious combination which gives the benefit of a selective sensor for an agent or antigen of interest. Further, Examiner asserts that the combination of Pinkel in view of Pepper is a proper combination for an array of regions, in which each region defines a resonant cavity or cavity as defined in independent claims 2, 23, 24, 44, and 45, as discussed above.

With regards to claims 8, 9, 17, 30, 31, and 38 Applicant argues that the shortcomings of Pinkel and Pepper discussed above are not remedied by the disclosure of Lewis. Examiner argues that, as discussed above, Pinkel and Pepper have no such

Art Unit: 1797

shortcomings, and as result claims 8, 9, 17, 30, 31, and 38 are maintained rejected under 35 USC 103(a) over Pinkel in view of Pepper and in further view of Lewis.

With regards to claims 18 and 39, Applicant argues that the shortcoming of Pinkel and Pepper discussed above are not remedied by the disclosure of Saul. Examiner argues that, as discussed above, Pinkel and Pepper have no such shortcomings, and as result claims 18 and 39 are maintained rejected under 35 USC 103(a) over Pinkel in view of Pepper and in further view of Saul.

Further, a new grounds of rejection over claims 1, 3, and 5-22 under 35 USC 112, 2nd paragraph and an objection to the specification for lacking antecedent basis has been applied in view of Applicant's amendment to claim 1 to include "...to generate a plurality of resonant cavity regions".

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

Art Unit: 1797

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NEIL TURK whose telephone number is (571)272-8914. The examiner can normally be reached on M-F, 9-630.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NT

Application/Control Number: 10/549,991
Art Unit: 1797

Page 22

/Sean E Conley/
Primary Examiner, Art Unit 1797